CALIFORNIA DIVISION OF MINES AND GEOLOGY

Fault Evaluation Report FER-68

September 30, 1977

1. Name of faults: San Jose fault and Walnut Creek fault.

2. Location of faults: The Ontario, San Dimas, and Baldwin Park 7½ minute quadrangles, Los Angeles and San Bernardino Counties (figure 1).

3. Reason for evaluation: This fault is located within the 1977 study area of the 10-year program for fault evaluation.

4. List of references:

a) California Department of Water Resources, 1966, Planned utilization of ground water basins, San Gabriel Valley: California Department of Water Resources Bulletin 104-2, Appendix A, 230 pages. Map scale 1:125,000.

(This is the only reference on the Walnut Creek fault.)

b) California Department of Water Resources, 1970, Meeting water demands in the Chino-Riverside area: California Department of Water Resources Bulletin 104-3, Appendix A, 108 pages. Map scale 1:127,000.

(The San Jose fault is mapped as a subsurface water barrier for about 11 km to the northeast of the San Jose Hills.)

c) Eckis, Rollin, 1928, Alluvial fans of the Cucamonga district, southern California: Journal of Geology, v. 36, no. 3, p. 224-247. Map scale 1:160,000.

(He states that the San Jose fault has very recent physiographic expression within the San Jose Hills.)

d) Eckis, Rollin, 1934, South coastal basin investigation, geology and ground water storage capacity of valley fill: California Division of Water Resources Bulletin 45, 279 p. Map scale 1:150,000.

(San Jose fault shown on plates A and C, scale 1:150,000, but nothing said in the text about the faults.)

e) English, W.A., 1926, Geology and oil resources of the Puente Hills region, southern California: U.S. Geological Survey Bulletin 768.

(He discusses the structure of the San Jose Hills, but does not mention either fault or show them on his map.)

f) Jennings, C.W., 1975, Fault map of California with locations of volcanoes, thermal springs and thermal wells: California Division of Mines and Geology, California Geologic Data Map Series, Map no. 1. Scale 1:750,000.

g) Harshman, E.N., 1933, Geology of the San Jose Hills, Los Angeles County, California: unpublished masters thesis, California Institute of Technology, Pasadena, California, 83 pages. Map scale 1:24,000.

(This is the best discussion of the part of the San Jose fault that lies within the San Jose Hills.)

h) Olmsted, F.H., 1950, Geology and oil prospects of western San Jose Hills, Los Angeles County, California: California Journal of Mines and Geology, v. 46, no. 2, p. 191-212. Scale 1:24,000.

(Discusses several small faults in the western part of the San Jose Hills.)

i) Real, C.R., and C. Cramer, 1977, Seismicity near Cucamonga fault, 1932 to 1976: California Division of Mines and Geology, unpublished maps and memorandum. Map scale 1:250,000.

j) Shelton, J.S., 1955, Glendora volcanic rocks, Los Angeles basin, California: Geological Society of America Bulletin, v. 66, no. 1, p. 45-90. Map scale 1:24,000.

(He includes a 1:24,000 map showing the San Jose fault.)

k) Woodford, A.O., T.G. Moran, and J.S. Shelton, 1946, Miocene conglomerates of the Puente and San Jose Hills, California: American Association of Petroleum Geologists Bulletin, v. 30, no. 4, p. 514-560. Map scale 1:121,000.

(Another small-scale (1:121,000) map showing the San Jose fault.)

l) Woodford, A.O., J.S. Shelton, and T.G. Moran, 1944, Stratigraphy and oil possibilities of Puente and San Jose Hills, California: U.S. Geological Survey Oil and Gas Investigations Preliminary Map 23. Scale 1:62,500.

(Another medium-scale (1:62,500) map showing the San Jose fault.)

5a. <u>Summary of available data for the San Jose fault:</u>

This is an east-northeast trending fault that extends from the central part of the San Jose Hills on the west to the vicinity of Claremont on the east (figure 4). Within the San Jose Hills, the San Jose fault is shown on several large-scale maps: Harshman (1933), Olmsted (1950), and Shelton (1955), all at a scale of 1:24,000, and Woodford and others (1944), at a scale of 1:62,500. There is considerable disparity among these maps as to the location of the fault (see figure 4).

Eckis (1928) briefly discusses the San Jose fault. He states (p. 246), "This fault has a very recent physiographic expression in the San Jose Hills section. Notched spurs mark the fault trace along the foot of the eroded scarp, the base of which has not yet receded appreciably from the fault." Harshman (1933), who calls the San Jose fault the "Buzzard Peak" fault, says (p. 67) that the fault can be "accurately traced", but also says (p. 64) that..."The fault plane is nowhere exposed, and the present escarpment is of a fault line type..." To the northwest of the San Jose Hills, the fault is known only as a subsurface water barrier.

Harshman (1933) also provides the only information regarding the attitude of and nature of displacement along the San Jose fault. He states (p. 65) that the fault has "...a northward dip of at least 80° to 85°," and that the fault is "...of the reverse type with the northern block overriding the southern one." Based on stratigraphic separation, he also adds (p. 65) that "The fault has a vertical displacement of at least 2,700 feet..."

Little is said about the recency of activity along the fault. As quoted above, Eckis (1928) says that the fault has a very recent physiographic expression within the San Jose Hills. He does not, however, define his use of the term "very recent." Harshman (1933, p. 65) says only that the fault is post-upper Puente in age. He says (p. 16) that the Puente Formation is middle and upper Miocene in age.

The youngest material cut by the fault trace at the surface is upper Miocene sedimentary and volcanic rock. The oldest material not cut is younger alluvium. California Department of Water Resources (1970, p. 10) says that the long northeastward extension of the San Jose fault is well-defined in the subsurface, but, "...the surface of the recent alluvial fan seems to be undisturbed...". Their cross section (plate 3) shows the base of "older alluvium" offset about 100 m vertically with the north side up.

5b. Summary of available data for the Walnut Creek fault:

California Department of Water Resources (1966) is the only reference for this fault. Their entire discussion of the fault (p. 47) is as follows:

> "The Walnut Creek fault trends northeast in the alluvium northwest of the San Jose Hills. The existence of the fault is suggested by a few water level differences across the fault, and petroleum exploration data substantiate the fault at depth."

They make no statements about how close to the surface the water barrier extends, or about the magnitude of offset of the strata at depth. Thier plate 9A, at a scale of 1:125,000, shows the fault as a subsurface feature. Their cross sections (plate 10) show no apparent offset of strata at depth.

Seismicity:

The seismicity maps (figures 2 and 3) show some possible relationships between the epicenter distributions and the fault locations. The 1932-1973 epicenter plot (figure 2) shows a weak alignment of epicenters with the Walnut Creek fault. The 1974-1976 map (figure 3) shows an arcuate pattern of epicenters extending in a southwesterly direction from the Cucamonga fault and passing between the San Jose and Walnut Creek faults. This line of epicenters may be related to a subsurface extension of the Cucamonga fault, or it may be related to the San Jose fault at depth. It must be borne in mind, however, that the positional accuracy of most of these epicenter plots is about plus or minus 5 km. At the scale of figures 2 and 3, that amounts to about 2 cm.

6. Interpretation of aerial photography: None.

7. Field observations: None.

8. Conclusions:

Based on the references, the San Jose fault has probably been active as recently as late Pleistocene time. The literature, however, is simply inadequate in its scope and content to answer the question as to whether the fault has undergone Holocene displacement. Likewise, the references are not clear as to whether or not the fault is well-defined. All but the westernmost 3 km of the fault is not known at the surface. The western 3 km of the fault occurs mainly within Miocene sedimentary rock, but the references are ambiguous as to its definition. The Walnut Creek fault is known only in the subsurface.

9. Recommendations:

On the basis of the literature, I recommend that neither fault be zoned. However, the San Jose fault, or at least part of the fault that occurs within the San Jose Hills, should be examined in aerial photography (older aerial photography, if possible). If the photos reveal any fairly recent-looking fault-generated features, then I will check them on the ground. Only then would I feel comfortable about making a recommendation on whether or not to zone any part of the fault.

10. Investigating geologist's name; date:

Drew P. Smith

DREW P. SMITH
Geologist
September 30, 1977

I agree with recommendations. Unless it can be established that faults are well-defined Holocene features, they should not be zoned.
EWH
10/26/77

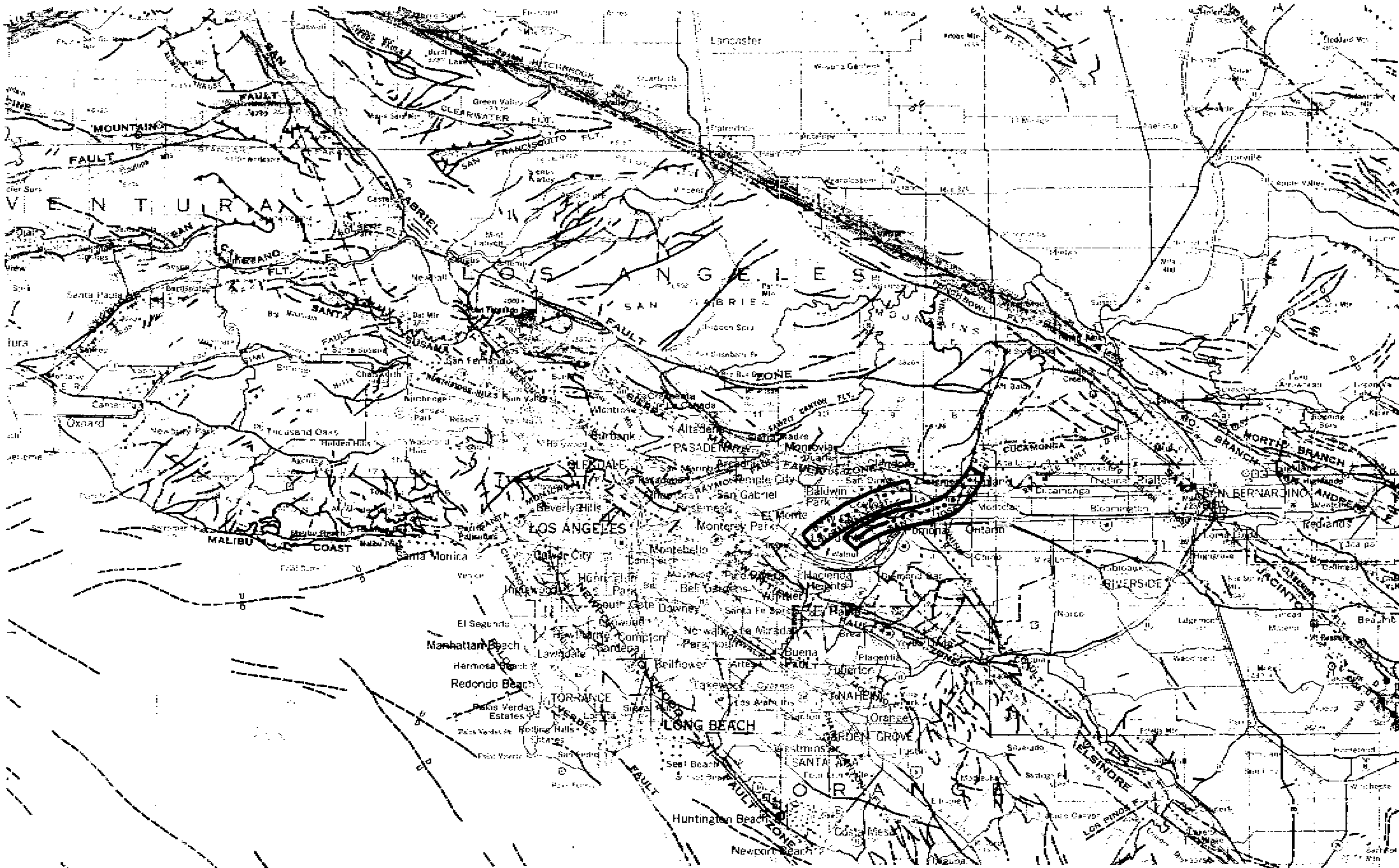

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Figure 1. Index map showing location of the San Jose and Walnut Creek faults. Map is modified from Jennings (1975).

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Figure 2. Seismicity map (modified from Real and Cramer, 1977).

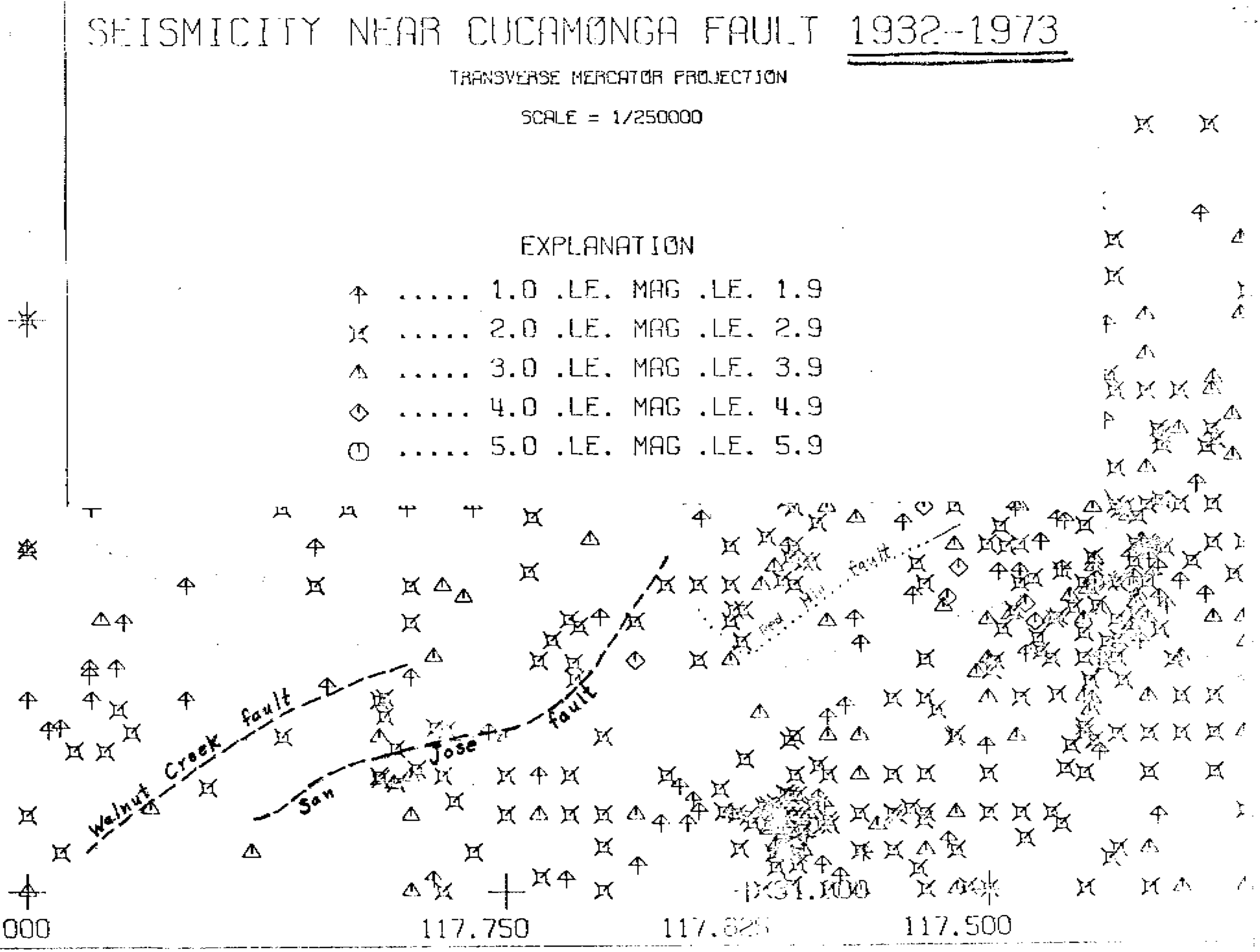

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Figure 3. Seismicity map (modified from Real and Cramer, 1977).